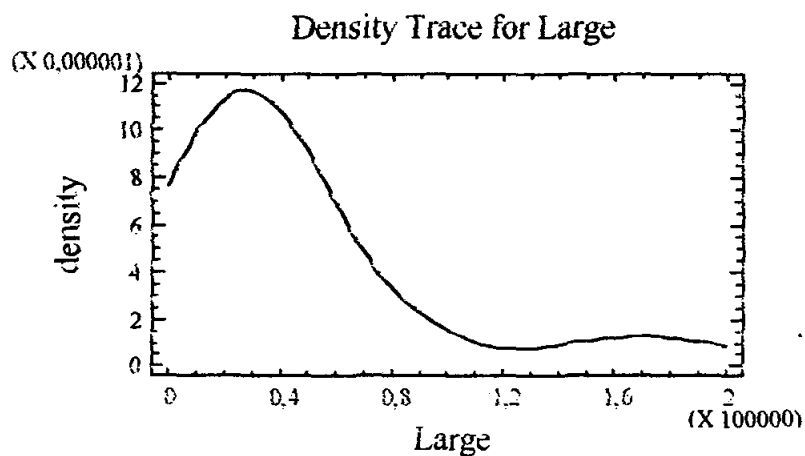


Lampiran 1: Hasil distribusi fitting



Analysis Summary

Data variable: Large

37 values ranging from 360,0 to 192000,0

Fitted Weibull distribution:

shape = 1,00005

scale = 47991,9

The StatAdvisor

This analysis shows the results of fitting a Weibull distribution to the data on Large. The estimated parameters of the fitted distribution are shown above. You can test whether the Weibull distribution fits the data adequately by selecting Goodness-of-Fit Tests from the list of Tabular Options. You can also assess visually how well the Weibull distribution fits by selecting Frequency Histogram from the list of Graphical Options. Other options within the procedure allow you to compute and display tail areas and critical values for the distribution. To select a different distribution, press the alternate mouse button and select Analysis Options.

Goodness-of-Fit Tests for Large

Chi-Square Test

	Lower Limit	Upper Limit	Observed Frequency	Expected Frequency	Chi-Square
at or below		7554,83	2	4,63	1,49
	7554,83	15274,3	4	4,63	0,08
	15274,3	23961,0	9	4,63	4,14
	23961,0	34219,6	7	4,63	1,22
	34219,6	47049,0	3	4,63	0,57
	47049,0	64621,1	5	4,63	0,03
	64621,1	93732,4	3	4,63	0,57
above	93732,4		4	4,63	0,08

Chi-Square = 8,18919 with 5 d.f. P-Value = 0,146113

Estimated Kolmogorov statistic DPLUS = 0,115228

Estimated Kolmogorov statistic DMINUS = 0,149111

Estimated overall statistic DN = 0,149111

Approximate P-Value = 0,392297

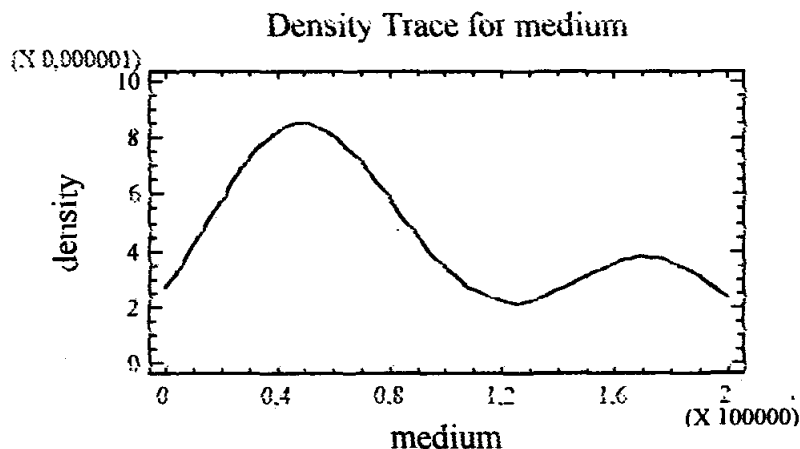
EDF Statistic	Value	Modified Form	P-Value
Kolmogorov-Smirnov D	0,149111	0,907006	<0.01*
Anderson-Darling A ²	0,984092	1,01645	<0.05*

*Indicates that the P-Value has been compared to tables of critical values specially constructed for fitting the currently selected distribution. Other P-values are based on general tables and may be very conservative.

The StatAdvisor

This pane shows the results of tests run to determine whether Large can be adequately modeled by a Weibull distribution. The chi-square test divides the range of Large into nonoverlapping intervals and compares the number of observations in each class to the number expected based on the fitted distribution. The Kolmogorov-Smirnov test computes the maximum distance between the cumulative distribution of Large and the CDF of the fitted Weibull distribution. In this case, the maximum distance is 0,149111. The other EDF statistics compare the empirical distribution function to the fitted CDF in different ways.

Since the smallest P-value amongst the tests performed is less than 0.01, we can accept the idea that Large comes from a Weibull distribution with 99% confidence.



Analysis Summary

Data variable: medium

95 values ranging from 7200,0 to 194900,0

Fitted Erlang distribution:

shape = 2,0

scale = 0,0000236602

The StatAdvisor

This analysis shows the results of fitting a Erlang distribution to the data on medium. The estimated parameters of the fitted distribution are shown above. You can test whether the Erlang distribution fits the data adequately by selecting Goodness-of-Fit Tests from the list of Tabular Options. You can also assess visually how well the Erlang distribution fits by selecting Frequency Histogram from the list of Graphical Options. Other options within the procedure allow you to compute and display tail areas and critical values for the distribution. To select a different distribution, press the alternate mouse button and select Analysis Options.

Goodness-of-Fit Tests for medium

Chi-Square Test

	Lower Limit	Upper Limit	Observed Frequency	Expected Frequency	Chi-Square
at or below		20163,7	4	7,08	1,34
	20163,7	30897,9	10	7,08	1,20
	30897,9	40629,6	7	7,08	0,00
	40629,6	50246,3	13	7,08	4,94
	50246,3	60215,5	7	7,08	0,00
	60215,5	70926,6	4	7,08	1,34
	70926,6	82981,7	9	7,08	0,50
	82981,7	96756,8	4	7,08	1,34
	96756,8	113805,0	2	7,08	3,65
	113805,0	136736,0	3	7,08	2,35
	136736,0	174021,0	10	7,08	3,41
above	174021,0		0	5,76	5,76

Chi-Square = 25,8682 with 9 d.f. P-Value = 0,00214691

Estimated Kolmogorov statistic DPLUS = 0,106926

Estimated Kolmogorov statistic DMINUS = 0,103152

Estimated overall statistic DN = 0,106926

Approximate P-Value = 0,296791

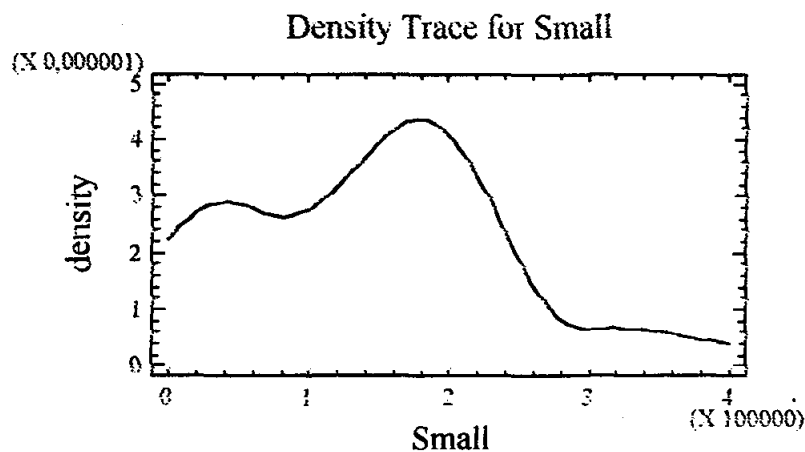
EDF Statistic	Value	Modified Form	P-Value
Kolmogorov-Smirnov D	0,106926	0,999919	>0,10
Anderson-Darling A ²	1,42921	1,42921	>0,10

*Indicates that the P-Value has been compared to tables of critical values specially constructed for fitting the currently selected distribution. Other P-values are based on general tables and may be very conservative.

The StatAdvisor

This pane shows the results of tests run to determine whether medium can be adequately modeled by a Erlang distribution. The chi-square test divides the range of medium into nonoverlapping intervals and compares the number of observations in each class to the number expected based on the fitted distribution. The Kolmogorov-Smirnov test computes the maximum distance between the cumulative distribution of medium and the CDF of the fitted Erlang distribution. In this case, the maximum distance is 0,106926. The other EDF statistics compare the empirical distribution function to the fitted CDF in different ways.

Since the smallest P-value amongst the tests performed is less than 0,01, we can accept the idea that medium comes from a Erlang distribution with 99% confidence.



Analysis Summary

Data variable: Small

17 values ranging from 34000,0 to 364000,0

Fitted exponential distribution:

mean = 143540,0

The StatAdvisor

This analysis shows the results of fitting an exponential distribution to the data on Small. The estimated parameters of the fitted distribution are shown above. You can test whether the exponential distribution fits the data adequately by selecting Goodness-of-Fit Tests from the list of Tabular Options. You can also assess visually how well the exponential distribution fits by selecting Frequency Histogram from the list of Graphical Options. Other options within the procedure allow you to compute and display tail areas and critical values for the distribution. To select a different distribution, press the alternate mouse button and select Analysis Options.

Goodness-of-Fit Tests for Small

Chi-Square Test

	Lower Limit	Upper Limit	Observed Frequency	Expected Frequency	Chi-Square
at or below		26171,9	2	2,83	0,25
	26171,9	58203,8	4	2,83	0,48
	58203,8	99500,1	0	2,92	2,92
	99500,1	157704,0	1	2,92	1,10
	157704,0	257204,0	9	2,92	9,40
above	257204,0		2	2,83	0,25

Chi-Square = 14,4118 with 4 d.f. P-Value = 0,00609046

Estimated Kolmogorov statistic DPLUS = 0,163001

Estimated Kolmogorov statistic DMINUS = 0,288176

Estimated overall statistic DM = 0,288176

Approximate P-Value = 0,118802

EDF Statistic	Value	Modified Form	P-Value
Kolmogorov-Smirnov D	0,288176	1,24506	<0.05*
Anderson-Darling A*2	1,42442	1,47469	0,0340*

*Indicates that the P-Value has been compared to tables of critical values specially constructed for fitting the currently selected distribution. Other P-values are based on general tables and may be very conservative.

The StatAdvisor

This pane shows the results of tests run to determine whether Small can be adequately modeled by an exponential distribution. The chi-square test divides the range of Small into nonoverlapping intervals and compares the number of observations in each class to the number expected based on the fitted distribution. The Kolmogorov-Smirnov test computes the maximum distance between the cumulative distribution of Small and the CDF of the fitted exponential distribution. In this case, the maximum distance is 0,288176. The other EDF statistics compare the empirical distribution function to the fitted CDF in different ways.

Since the smallest P-value amongst the tests performed is less than 0.01, we can accept the idea that Small comes from an exponential distribution with 99% confidence.

Lampiran 2: Perhitungan Matriks Insidensial terhadap kuantitas

Bobot pada matriks ini dihitung melalui banyaknya sarung tangan yang dipindahkan pada tiap kali *firing* sehingga:

T1 → T2 mempunyai bobot 1 karena pemindahan sebanyak 1 karung sarung tangan berisi 60 dzp dan tidak ada perubahan kuantitas disini.

T2 → T3-T8 pemasangan pada mesing sebanyak 43 dzp sehingga bila dihitung bobotnya:

$$N = 43/60 = 0.717$$

T3-T8 → T9 tidak mengalami perubahan, atau bobot dapat dianggap sebagai 1 karena proses ini hanya bersifat sebagai transfer saja menuju buffer

T9 → T10 mengalami perpindahan sebanyak 30 dzp menuju mesin buffer setter sehingga bobotnya berubah menjadi:

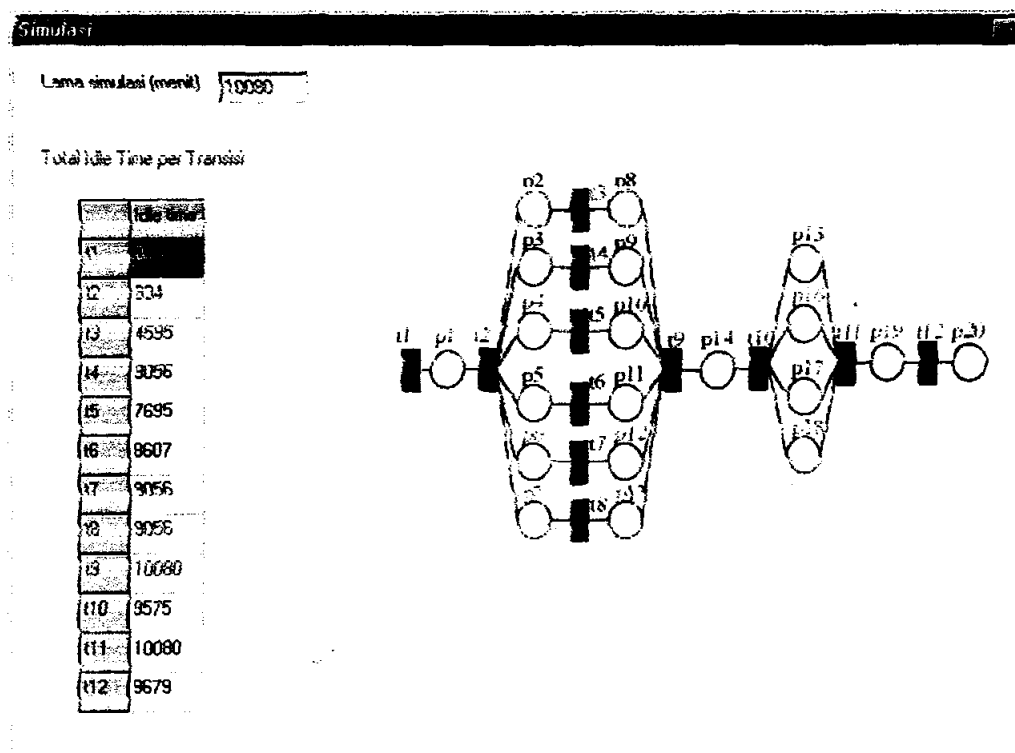
$$N = 30/60 = 0.5$$

T10 → T11 mengalami perpindahan dari buffer setter menuju mesin setter sebanyak 24 dzp sehingga bobotnya:

$$N = 24/60 = 0.4$$

T11 → T12 sarung tangan yang sudah dipacking dari setter menuju operator mempunyai bobot 1 karena tidak ada perubahan kuantitas selama proses disini.

Lampiran 3: Tampilan dan Bahasa Pemrograman Jaringan Petri dengan Borland Delphi




```

unit Engine;

interface

uses
  Windows, Messages, SysUtils, Classes, Graphics, Controls, Forms,
  Dialogs,
  jpeg, ExtCtrls, StdCtrls, Grids;

type
  TForm1 = class(TForm)
    Image1: TImage;
    Label1: TLabel;
    Edit1: TEdit;
    StringGrid1: TStringGrid;
    Label2: TLabel;
    procedure Edit1KeyDown(Sender: TObject; var Key: Word;
      Shift: TShiftState);
    procedure FormActivate(Sender: TObject);
  private:
    { Private declarations }
  public:
    { Public declarations }
  end;

var
  Form1: TForm1;
  Buffer: Array[1..20,1..3] of Integer;
  Idle: Array[1..12,1..300000] of Integer;
  Counter: Array[1..12] of Integer;
  Time: Integer;
  Proses: Array[1..7] of Integer;
  FlagM9, FlagL9, FlagS9: Boolean;
  FlagI11, FlagI12, FlagI13, FlagI14: Boolean;

Const Items = 30; // Jumlah item dalam 1 karung

implementation

{$R *.DPM}

Procedure Inisialisasi;
Var Count1, Count2: Integer;
begin
  // Reset buffer
  For Count1 := 1 to 20 do
    For Count2 := 1 to 3 do
      Buffer[Count1,Count2] := 0;

  // Reset Idle time dan counter untuk masing-masing transisi
  For Count1 := 1 to 12 do
  begin
    Counter[Count1] := 1;
    For Count2 := 1 to 300000 do
      Idle[Count1,Count2] := 0;
  end;
End;

```

```

// Reset Process time untuk masing-masing mesin
For Count1 := 1 to 7 do
begin
    Proses[Count1] := 0;
End;

// Reset Waktu mulai
Time := 0;

// Reset flag proses
FlagM9 := False;
FlagL9 := False;
FlagS9 := False;
Flagl11 := False;
Flagl12 := False;
Flagl13 := False;
Flagl14 := False;
End;

Procedure Transisi1;
Var Barang: Integer;
begin
    Time := Time + 1;
    Randomize;
    Barang := Random(3);
    If Barang = 0 then
        // Buffer medium
        Buffer[1,1] := Buffer[1,1] + 2*Items
    Else
        If Barang = 1 then
            // Buffer large
            Buffer[1,2] := Buffer[1,2] + 2*Items
        Else
            //Buffer small
            Buffer[1,3] := Buffer[1,3] + 2*Items;
    End;

    Procedure Transisi2;
    begin
        If (Buffer[1,1]>=2*Items) and ((Buffer[2,1]<43) or
        (Buffer[3,1]<43) or (Buffer[6,1]<43) or (Buffer[7,1]<43)) then
            begin
                If Buffer[2,1]<43 then
                    begin
                        Buffer[2,1] := Buffer[2,1] + 2*Items;
                        Buffer[1,1] := Buffer[1,1] - 2*Items;
                    End
                Else
                    If Buffer[3,1]<43 then
                        begin
                            Buffer[3,1] := Buffer[3,1] + 2*Items;
                            Buffer[1,1] := Buffer[1,1] - 2*Items;
                        End
                    Else
                        If Buffer[6,1]<43 then

```

```

begin
  Buffer[6,1] := Buffer[6,1] + 2*Items;
  Buffer[1,1] := Buffer[1,1] - 2*Items;
End
Else
  if Buffer[7,1]<43 then
    begin
      Buffer[7,1] := Buffer[7,1] + 2*Items;
      Buffer[1,1] := Buffer[1,1] - 2*Items;
    end;
  if Idle[2,Counter[2]]>0 then
    Counter[2] := Counter[2] + 1;
  end
End
Else
  if (Buffer[1,2]>=2*Items) and (Buffer[4,2]<43) then
    begin
      Buffer[4,2] := Buffer[4,2] + 2*Items;
      Buffer[1,2] := Buffer[1,2] - 2*Items;
      if Idle[2,Counter[2]]>0 then
        Counter[2] := Counter[2] + 3;
      end
    end
  else
    if (Buffer[1,3]>=2*Items) and (Buffer[5,3]<43) then
      begin
        Buffer[5,3] := Buffer[5,3] + 2*Items;
        Buffer[1,3] := Buffer[1,3] - 2*Items;
        if Idle[2,Counter[2]]>0 then
          Counter[2] := Counter[2] + 1;
        end
      end
    else
      Idle[2,Counter[2]] := Idle[2,Counter[2]] + 1;
    end;
  end;
end;

Procedure Transact3;
begin
  if (Buffer[2,1]>=40) and (Buffer[9,1]=0) then
    begin
      Buffer[9,1] := Buffer[9,1] + 43;
      Buffer[2,1] := Buffer[2,1] - 43;
      if Idle[3,Counter[3]]>0 then
        Counter[3] := Counter[3] + 1;
      end
    end
  else
    Idle[3,Counter[3]] := Idle[3,Counter[3]] + 1;
  end;
end;

Procedure Transact4;
begin
  if (Buffer[3,1]>=43) and (Buffer[9,1]=0) then
    begin
      Buffer[9,1] := Buffer[9,1] + 43;
      Buffer[3,1] := Buffer[3,1] - 43;
      if Idle[4,Counter[4]]>0 then
        Counter[4] := Counter[4] + 1;
      end
    end
  else
    end
end

```

```

    Idle[4,Counter[4]] := Idle[4,Counter[4]] + 1;
End;

```

```

Procedure Transisi5;

```

```

begin
    If (Buffer[4,2]>=43) and (Buffer[10,2]=0) then
    begin
        Buffer[10,2] := Buffer[10,2] + 43;
        Buffer[4,2] := Buffer[4,2] - 43;
        If Idle[5,Counter[5]]>0 then
            Counter[5] := Counter[5] + 1;
        End
    Else
        Idle[5,Counter[5]] := Idle[5,Counter[5]] + 1;
    End;

```

```

Procedure Transisi6;

```

```

begin
    If (Buffer[5,3]>=43) and (Buffer[11,3]=0) then
    begin
        Buffer[11,3] := Buffer[11,3] + 43;
        Buffer[5,3] := Buffer[5,3] - 43;
        If Idle[6,Counter[6]]>0 then
            Counter[6] := Counter[6] + 1;
        End
    Else
        Idle[6,Counter[6]] := Idle[6,Counter[6]] + 1;
    End;

```

```

Procedure Transisi7;

```

```

begin
    If (Buffer[6,1]>=43) and (Buffer[12,1]=0) then
    begin
        Buffer[12,1] := Buffer[12,1] + 43;
        Buffer[6,1] := Buffer[6,1] - 43;
        If Idle[7,Counter[7]]>0 then
            Counter[7] := Counter[7] + 1;
        End
    Else
        Idle[7,Counter[7]] := Idle[7,Counter[7]] + 1;
    End;

```

```

Procedure Transisi8;

```

```

begin
    If (Buffer[7,1]>=43) and (Buffer[13,1]=0) then
    begin
        Buffer[13,1] := Buffer[13,1] + 43;
        Buffer[7,1] := Buffer[7,1] - 43;
        If Idle[8,Counter[8]]>0 then
            Counter[8] := Counter[8] + 1;
        End
    Else
        Idle[8,Counter[8]] := Idle[8,Counter[8]] + 1;
    End;

```

```

Procedure Transisi9;

```

```

begin
  If Buffer[8,1]>=43 then
    begin
      FlagM9 := True;
      If Proses[1]>=190 then
        begin
          FlagM9 := False;
          Buffer[14,1] := Buffer[14,1] + 4*43;
          Buffer[8,1] := Buffer[8,1] - 43;
          Buffer[9,1] := Buffer[9,1] - 43;
          Buffer[12,1] := Buffer[12,1] - 43;
          Buffer[13,1] := Buffer[13,1] - 43;
          If Idle[9,Counter[9]]>0 then
            Counter[9] := Counter[9] + 1;
          End;
        end;
      End;
    end;
  If Buffer[10,2]>=43 then
    begin
      FlagL9 := True;
      If Proses[2]>=226 then
        begin
          FlagL9 := False;
          Buffer[14,2] := Buffer[14,2] + 43;
          Buffer[10,2] := Buffer[10,2] - 43;
          If Idle[9,Counter[9]]>0 then
            Counter[9] := Counter[9] + 1;
          End;
        end;
      End;
    end;
  If Buffer[11,3]>=43 then
    begin
      FlagS9 := True;
      If Proses[3]>=170 then
        begin
          FlagS9 := False;
          Buffer[14,3] := Buffer[14,3] + 43;
          Buffer[11,3] := Buffer[11,3] - 43;
          If Idle[9,Counter[9]]>0 then
            Counter[9] := Counter[9] + 1;
          End;
        end;
      End;
    end;
  If (Buffer[8,1]=0) and (Buffer[10,2]=0) and (Buffer[11,3]=0) or
    (Proses[1]<190) or (Proses[2]<226) or (Proses[3]<170) then
    begin
      Idle[9,Counter[9]] := Idle[9,Counter[9]] + 1;
      If (Buffer[8,1]>0) and (Proses[1]<190) then
        Proses[1] := Proses[1] + 1;
      If (Buffer[10,2]>0) and (Proses[2]<226) then
        Proses[2] := Proses[2] + 1;
      If (Buffer[11,3]>0) and (Proses[3]<170) then
        Proses[3] := Proses[3] + 1;
      End;
    end;
  End;
end;

Procedure Transisi10;
begin

```

```

    If ((Buffer[14,1]>24) or (Buffer[14,2]>24) or (Buffer[14,3]>24))
and
    (((Buffer[15,1]=0) and (Buffer[15,2]=0) and (Buffer[15,3]=0))
or
    ((Buffer[16,1]=0) and (Buffer[16,2]=0) and (Buffer[16,3]=0))
or
    ((Buffer[17,1]=0) and (Buffer[17,2]=0) and (Buffer[17,3]=0))
or
    ((Buffer[18,1]=0) and (Buffer[18,2]=0) and (Buffer[18,3]=0)))
then
    begin
        If (Buffer[15,1]=0) and (Buffer[15,2]=0) and (Buffer[15,3]=0)
then
        begin
            If Buffer[14,1]>=24 then
            begin
                Buffer[15,1] := Buffer[15,1] + 24;
                Buffer[14,1] := Buffer[14,1] - 24;
                If Idle[10,Counter[10]]>0 then
                    Counter[10] := Counter[10] + 1;
                End
            Else
                If Buffer[14,2]>=24 then
                begin
                    Buffer[15,2] := Buffer[15,2] + 24;
                    Buffer[14,2] := Buffer[14,2] - 24;
                    If Idle[10,Counter[10]]>0 then
                        Counter[10] := Counter[10] + 1;
                    End
                Else
                    If Buffer[14,3]>=24 then
                    begin
                        Buffer[15,3] := Buffer[15,3] + 24;
                        Buffer[14,3] := Buffer[14,3] - 24;
                        If Idle[10,Counter[10]]>0 then
                            Counter[10] := Counter[10] + 1;
                        End;
                    End
                Else
                    If (Buffer[16,1]=0) and (Buffer[16,2]=0) and (Buffer[16,3]=0)
then
                    begin
                        If Buffer[14,1]>=24 then
                        begin
                            Buffer[16,1] := Buffer[16,1] + 24;
                            Buffer[14,1] := Buffer[14,1] - 24;
                            If Idle[10,Counter[10]]>0 then
                                Counter[10] := Counter[10] + 1;
                            End
                        Else
                            If Buffer[14,2]>=24 then
                            begin
                                Buffer[16,2] := Buffer[16,2] + 24;
                                Buffer[14,2] := Buffer[14,2] - 24;
                                If Idle[10,Counter[10]]>0 then
                                    Counter[10] := Counter[10] + 1;
                                End
                            End
                        End
                    End
                End
            End
        End
    End

```



```

End;
Else
  If Buffer[14,3]>=24 then
    begin
      Buffer[13,3] := Buffer[13,3] + 24;
      Buffer[14,3] := Buffer[14,3] - 24;
      If Idle[10,Counter[10]]>0 then
        Counter[10] := Counter[10] + 1;
      End;
    End;
  End;
Else
  End;
End;

Idle[10,Counter[10]] := Idle[10,Counter[10]] + 1;
End;

Procedure Transf11;
begin
  If (Buffer[15,1]>=24) or (Buffer[15,2]>=24) or
  (Buffer[15,3]>=24) then
    begin
      Flag11 := True;
      If Proses[1]>=399 then
        begin
          Flag11 := False;
          If Buffer[15,1]>=24 then
            begin
              Buffer[19,1] := Buffer[19,1] + 24;
              Buffer[15,1] := Buffer[15,1] - 24;
            End
          Else
            If Buffer[15,2]>=24 then
              begin
                Buffer[19,2] := Buffer[19,2] + 24;
                Buffer[15,2] := Buffer[15,2] - 24;
              End
            Else
              If Buffer[15,3]>=24 then
                begin
                  Buffer[19,3] := Buffer[19,3] + 24;
                  Buffer[15,3] := Buffer[15,3] - 24;
                End;
              If Idle[11,Counter[11]]>0 then
                Counter[11] := Counter[11] + 1;
              End;
            End;
          End;
        End;
      If (Buffer[16,1]>=24) or (Buffer[16,2]>=24) or
      (Buffer[16,3]>=24) then
        begin
          Flag12 := True;
          If Proses[5]>=399 then
            begin
              Flag12 := False;
              If Buffer[16,1]>=24 then
                begin
                  Buffer[19,1] := Buffer[19,1] + 24;

```



```

    Buffer[16,1] := Buffer[16,1] - 24;
  End
Else
  If Buffer[16,2]>=24 then
  begin
    Buffer[19,2] := Buffer[19,2] + 24;
    Buffer[16,2] := Buffer[16,2] - 24;
  End
Else
  If Buffer[16,3]>=24 then
  begin
    Buffer[19,3] := Buffer[19,3] + 24;
    Buffer[16,3] := Buffer[16,3] - 24;
  End;
  If Idle[11,Counter[11]]>0 then
    Counter[11] := Counter[11] + 1;
  End;
End;

If (Buffer[17,1]>=24) or (Buffer[17,2]>=24) or
(Buffer[17,3]>=24) then
begin
  Flag113 := True;
  If Proses[6]>=388 then
  begin
    Flag113 := False;
    If Buffer[17,1]>=24 then
    begin
      Buffer[19,1] := Buffer[19,1] + 24;
      Buffer[17,1] := Buffer[17,1] - 24;
    End
    Else
      If Buffer[17,2]>=24 then
      begin
        Buffer[19,2] := Buffer[19,2] + 24;
        Buffer[17,2] := Buffer[17,2] - 24;
      End
      Else
        If Buffer[17,3]>=24 then
        begin
          Buffer[19,3] := Buffer[19,3] + 24;
          Buffer[17,3] := Buffer[17,3] - 24;
        End;
        If Idle[11,Counter[11]]>0 then
          Counter[11] := Counter[11] + 1;
        End;
      End;
    End;

    If (Buffer[18,1]>=24) or (Buffer[18,2]>=24) or
    (Buffer[18,3]>=24) then
    begin
      Flag114 := True;
      If Proses[7]>=388 then
      begin
        Flag114 := False;
        If Buffer[18,1]>=24 then

```

```

begin
  Buffer[19,1] := Buffer[19,1] + 24;
  Buffer[18,1] := Buffer[18,1] - 24;
End
Else
  If Buffer[18,2]>=24 then
begin
  Buffer[19,2] := Buffer[19,2] + 24;
  Buffer[18,2] := Buffer[18,2] - 24;
End
Else
  If Buffer[18,3]>=24 then
begin
  Buffer[19,3] := Buffer[19,3] + 24;
  Buffer[18,3] := Buffer[18,3] - 24;
End;
  If Idle[11,Counter[11]]>0 then
    Counter[11] := Counter[11] + 1;
End;
End;

  If ((Buffer[15,1]=0) and (Buffer[15,2]=0) and (Buffer[15,3]=0)
and
  (Buffer[16,1]=0) and (Buffer[16,2]=0) and (Buffer[16,3]=0)
and
  (Buffer[17,1]=0) and (Buffer[17,2]=0) and (Buffer[17,3]=0)
and
  (Buffer[18,1]=0) and (Buffer[18,2]=0) and (Buffer[18,3]=0))
or
  (Proses[4]<388) or (Proses[5]<388) or (Proses[6]<388) or
  (Proses[7]<388) then
begin
  Idle[11,Counter[11]] := Idle[11,Counter[11]] + 1;
  If ((Buffer[15,1]>0) or (Buffer[15,2]>0) or (Buffer[15,3]>0))
and (Proses[4]<388) then
    Proses[4] := Proses[4] + 1;
  If ((Buffer[16,1]>0) or (Buffer[16,2]>0) or (Buffer[16,3]>0))
and (Proses[5]<388) then
    Proses[5] := Proses[5] + 1;
  If ((Buffer[17,1]>0) or (Buffer[17,2]>0) or (Buffer[17,3]>0))
and (Proses[6]<388) then
    Proses[6] := Proses[6] + 1;
  If ((Buffer[18,1]>0) or (Buffer[18,2]>0) or (Buffer[18,3]>0))
and (Proses[7]<388) then
    Proses[7] := Proses[7] + 1;
End;
End;

Procedure Transisi12;
begin
  If (Buffer[19,1]>=60) or (Buffer[19,2]>=60) or
  (Buffer[19,3]>=60) then
begin
  If Buffer[19,1]>=60 then
begin
  Buffer[20,1] := Buffer[20,1] + 60;

```

```

    Buffer[19,1] := Buffer[19,1] - 60;
End
Else
If Buffer[19,2]>=60 then
begin
    Buffer[20,2] := Buffer[20,2] + 60;
    Buffer[19,2] := Buffer[19,2] - 60;
End
Else
If Buffer[19,3]>=60 then
begin
    Buffer[20,3] := Buffer[20,3] + 60;
    Buffer[19,3] := Buffer[19,3] - 60;
End;
If Idle[12,Counter[12]]>0 then
    Counter[12] := Counter[12] + 1;
End
Else
    Idle[12,Counter[12]] := Idle[12,Counter[12]] + 1;
End;

procedure TForm1.Edit1KeyDown(Sender: TObject; var Key: Word;
    Shift: TShiftState);
Var LamaSimulasi, Simulasi: Integer;
    Lapor: Array[1..12] of Integer;
    LastCount: Integer;
    LastCount2: Integer;
begin
    If Key=13 then
    begin
        If Edit1.Text <> '' then
        begin
            Inisialisasi;
            Simulasi := 0;
            LamaSimulasi := StrToInt(Edit1.Text);
            While Simulasi<LamaSimulasi do
            begin
                Transisi1;
                Transisi2;
                Transisi3;
                Transisi4;
                Transisi5;
                Transisi6;
                Transisi7;
                Transisi8;
                Transisi9;
                Transisi10;
                Transisi11;
                Transisi12;
                Simulasi := Simulasi + 1;
            End;
            For LastCount := 1 to 12 do
                Lapor[LastCount] := 0;
            For LastCount := 1 to 12 do
                For LastCount2 := 1 to Counter[LastCount] do

```

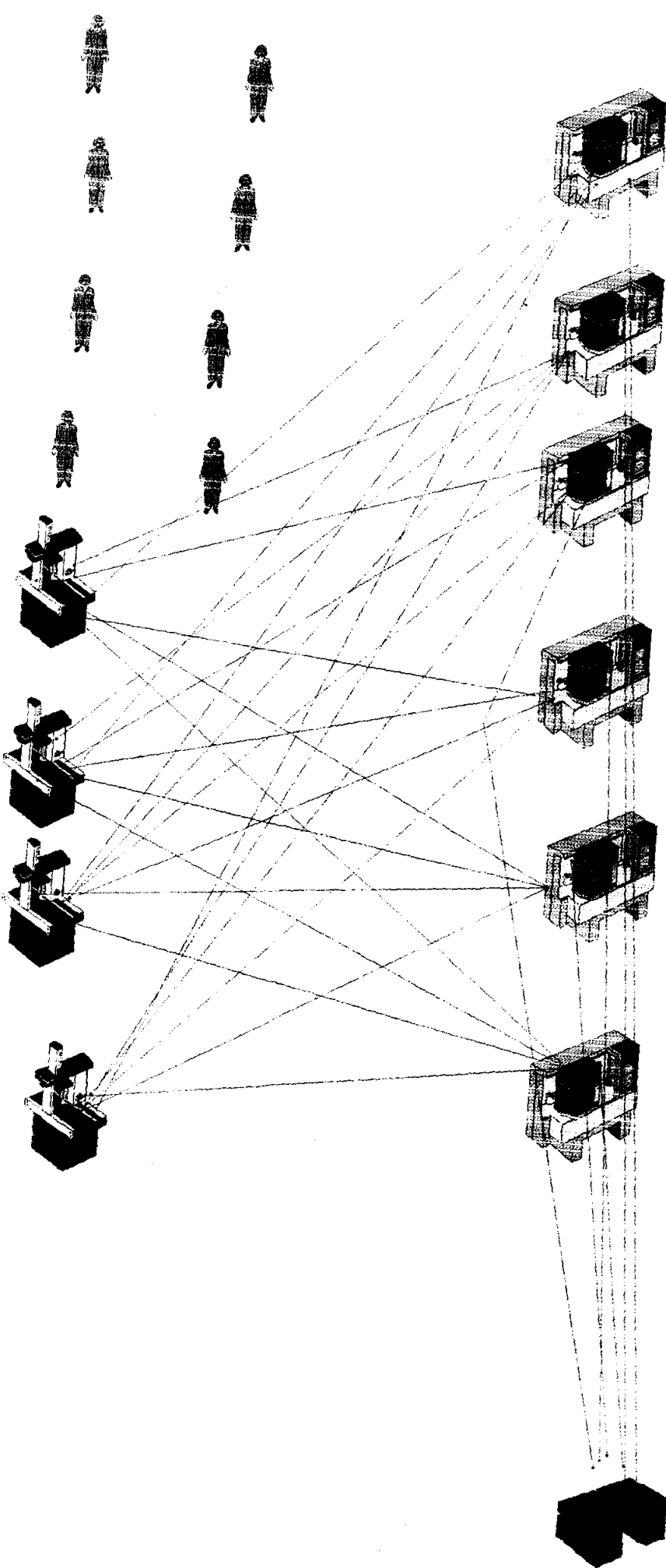
```

        Lapor[LastCount] := Lapor[LastCount] +
Idle[LastCount, LastCount2];
    For LastCount := 1 to 12 do
        StringGrid1.Cells[1, LastCount] :=
IntToStr(Lapor[LastCount]);
    End;
End;
end;

procedure TForm1.FormActivate(Sender: TObject);
Var Count: Integer;
begin
    Randomize;
    StringGrid1.Cells[1, 0] := 'Idle time';
    For Count := 1 to 12 do
        StringGrid1.Cells[0, Count] := 't'+IntToStr(Count);
    end;

end.

```



```

*****
*
*           Formatted Listing of Model:
*           C:\My Documents\TA\modeltarev-1.MOD
*
*****

```

```

Time Units:           Minutes
Distance Units:       Meters

```

```

*****
*                               Locations
*
*****

```

Name	Cap	Units	Stats	Rules	Cost
MESIN_DOTTING_M1	86	1	Time Series Oldest,	,	
MESIN_DOTTING_M2	86	1	Time Series Oldest,	,	
MESIN_DOTTING_L	86	1	Time Series Oldest,	,	
MESIN_DOTTING_S	86	1	Time Series Oldest,	,	
MESIN_DOTTING_M3	86	1	Time Series Oldest,	,	
MESIN_DOTTING_M4	86	1	Time Series Oldest,	,	
SETTER_1	130	1	Time Series Oldest,	,	
SETTER_2	130	1	Time Series Oldest,	,	
SETTER_3	130	1	Time Series Oldest,	,	
SETTER_4	130	1	Time Series Oldest,	,	
Operator	100	1	Time Series Oldest,	,	
Operator2	100	1	Time Series Oldest,	,	
Operator3	100	1	Time Series Oldest,	,	
Operator4	100	1	Time Series Oldest,	,	
Operator5	100	1	Time Series Oldest,	,	
Operator6	100	1	Time Series Oldest,	,	
Operator7	100	1	Time Series Oldest,	,	
Operator8	100	1	Time Series Oldest,	,	
BUFFER_STOCK	720	1	Time Series Oldest,	,	

```

*****
*                               Entities
*
*****

```

Name	Speed (mpm)	Stats	Cost
SARUNG TANGAN S 150		Time Series	
SARUNG TANGAN M 150		Time Series	
SARUNG TANGAN L 150		Time Series	

* Path Networks *

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	3.9	1
			N3	N4	Bi	7.8	1
			N5	N6	Bi	11.7	1
			N7	N8	Bi	15.6	1
			N9	N10	Bi	19.5	1
			N11	N12	Bi	23.4	1
			N13	N14	Bi	5.4	1
			N13	N15	Bi	5.3	1
			N13	N16	Bi	5.4	1
			N13	N17	Bi	5.5	1
			N18	N19	Bi	7.1	1
			N18	N20	Bi	7.2	1
			N18	N21	Bi	7.3	1
			N18	N22	Bi	7.4	1
			N23	N19	Bi	10.1	1
			N23	N24	Bi	10.27	1
			N23	N25	Bi	11.1	1
			N26	N27	Bi	14.3	1
			N26	N24	Bi	14.1	1
			N28	N21	Bi	14.3	1
			N29	N30	Bi	14.4	1
			N31	N32	Bi	17.5	1
			N31	N33	Bi	17.1	1
			N31	N34	Bi	17.4	1
			N31	N35	Bi	17.3	1
			N36	N37	Bi	21.6	1
			N38	N39	Bi	21.5	1
			N40	N24	Bi	21.8	1
			N38	N41	Bi	22	1

```

*****
*                                     Interfaces                                     *
*****

```

```
*****
*                                     Processing                                     *
*****
```

Process			Routing				
Entity	Location	Operation	Blk	Output	Destination	Rule	Move Logi
SARUNG_TANGAN_S	BUFFER_STOCK						
		ACCUM 86					
			1	SARUNG_TANGAN_S	MESIN_DOTTING_S	FIRST 1	

SARUNG_TANGAN_S MESIN_DOTTING_S WAIT 0.033 accum 24

SARUNG_TANGAN_S SETTER_1 WAIT .1346

SARUNG_TANGAN_S SETTER_2 WAIT .1346

SARUNG_TANGAN_S SETTER_3 WAIT .1346

SARUNG_TANGAN_S SETTER_4 wait .1346

SARUNG_TANGAN_S Operator WAIT .175
 SARUNG_TANGAN_S Operator2 wait .175
 SARUNG_TANGAN_S Operator3 wait .175
 SARUNG_TANGAN_S Operator4 wait .175
 SARUNG_TANGAN_S Operator5 wait .175

1	SARUNG_TANGAN_S SETTER_1	0.150000	1
	SARUNG_TANGAN_S SETTER_2	0.150000	
	SARUNG_TANGAN_S SETTER_3	0.150000	
	SARUNG_TANGAN_S SETTER_4	0.150000	
1	SARUNG_TANGAN_S Operator	0.125000	1
	SARUNG_TANGAN_S Operator2	0.125000	
	SARUNG_TANGAN_S Operator3	0.125000	
	SARUNG_TANGAN_S Operator4	0.125000	
	SARUNG_TANGAN_S Operator5	0.125000	
	SARUNG_TANGAN_S Operator6	0.125000	
	SARUNG_TANGAN_S Operator7	0.125000	
	SARUNG_TANGAN_S Operator8	0.125000	
1	SARUNG_TANGAN_S Operator	0.125000	1
	SARUNG_TANGAN_S Operator2	0.125000	
	SARUNG_TANGAN_S Operator3	0.125000	
	SARUNG_TANGAN_S Operator4	0.125000	
	SARUNG_TANGAN_S Operator5	0.125000	
	SARUNG_TANGAN_S Operator6	0.125000	
	SARUNG_TANGAN_S Operator7	0.125000	
	SARUNG_TANGAN_S Operator8	0.125000	
1	SARUNG_TANGAN_S Operator	0.125000	1
	SARUNG_TANGAN_S Operator2	0.125000	
	SARUNG_TANGAN_S Operator3	0.125000	
	SARUNG_TANGAN_S Operator4	0.125000	
	SARUNG_TANGAN_S Operator5	0.125000	
	SARUNG_TANGAN_S Operator6	0.125000	
	SARUNG_TANGAN_S Operator7	0.125000	
	SARUNG_TANGAN_S Operator8	0.125000	
1	SARUNG_TANGAN_S Operator	0.125000	1
	SARUNG_TANGAN_S Operator2	0.125000	
	SARUNG_TANGAN_S Operator3	0.125000	
	SARUNG_TANGAN_S Operator4	0.125000	
	SARUNG_TANGAN_S Operator5	0.125000	
	SARUNG_TANGAN_S Operator6	0.125000	
	SARUNG_TANGAN_S Operator7	0.125000	
	SARUNG_TANGAN_S Operator8	0.125000	
1	SARUNG_TANGAN_S EXIT	FIRST	1
1	SARUNG_TANGAN_S EXIT	FIRST	1
1	SARUNG_TANGAN_S EXIT	FIRST	1
1	SARUNG_TANGAN_S Operator5	FIRST	1
1	SARUNG_TANGAN_S EXIT	FIRST	1

SARUNG_TANGAN_S Operator6	wait .175	1	SARUNG_TANGAN_S EXIT	FIRST 1
SARUNG_TANGAN_S Operator7	wait .175	1	SARUNG_TANGAN_S EXIT	FIRST 1
SARUNG_TANGAN_S Operator8	wait .175	1	SARUNG_TANGAN_S EXIT	FIRST 1
SARUNG_TANGAN_M BUFFER_STOCK	accum 86			
		1	SARUNG_TANGAN_M MESIN_DOTTING_M1	0.250000 1
			SARUNG_TANGAN_M MESIN_DOTTING_M3	0.250000
			SARUNG_TANGAN_M MESIN_DOTTING_M2	0.250000
			SARUNG_TANGAN_M MESIN_DOTTING_M4	0.250000
SARUNG_TANGAN_M MESIN_DOTTING_M1	wait .0368 accum 24	1	SARUNG_TANGAN_M SETTER_1	0.250000 1
			SARUNG_TANGAN_M SETTER_2	0.250000
			SARUNG_TANGAN_M SETTER_3	0.250000
			SARUNG_TANGAN_M SETTER_4	0.250000
SARUNG_TANGAN_M MESIN_DOTTING_M2	wait .0368 accum 24	1	SARUNG_TANGAN_M SETTER_1	0.250000 1
			SARUNG_TANGAN_M SETTER_2	0.250000
			SARUNG_TANGAN_M SETTER_3	0.250000
			SARUNG_TANGAN_M SETTER_4	0.250000
SARUNG_TANGAN_M MESIN_DOTTING_M3	wait .0368 accum 24	1	SARUNG_TANGAN_M SETTER_1	0.250000 1
			SARUNG_TANGAN_M SETTER_2	0.250000
			SARUNG_TANGAN_M SETTER_3	0.250000
			SARUNG_TANGAN_M SETTER_4	0.250000
SARUNG_TANGAN_M MESIN_DOTTING_M4	wait .0368 accum 24	1	SARUNG_TANGAN_M SETTER_1	0.250000 1
			SARUNG_TANGAN_M SETTER_2	0.250000
			SARUNG_TANGAN_M SETTER_3	0.250000
			SARUNG_TANGAN_M SETTER_4	0.250000
SARUNG_TANGAN_M SETTER_1	wait .1346	1	SARUNG_TANGAN_M Operator	0.125000 1
			SARUNG_TANGAN_M Operator2	0.125000
			SARUNG_TANGAN_M Operator3	0.125000
			SARUNG_TANGAN_M Operator4	0.125000
			SARUNG_TANGAN_M Operator5	0.125000
			SARUNG_TANGAN_M Operator6	0.125000
			SARUNG_TANGAN_M Operator7	0.125000
			SARUNG_TANGAN_M Operator8	0.125000
SARUNG_TANGAN_M SETTER_2	wait .1346	1	SARUNG_TANGAN_M Operator	0.125000 1
			SARUNG_TANGAN_M Operator2	0.125000
			SARUNG_TANGAN_M Operator3	0.125000
			SARUNG_TANGAN_M Operator4	0.125000
			SARUNG_TANGAN_M Operator5	0.125000

			SARUNG_TANGAN_M Operator1	0.125000
			SARUNG_TANGAN_M Operator2	0.125000
			SARUNG_TANGAN_M Operator3	0.125000
SARUNG_TANGAN_M SETTER_3	wait .1346	1	SARUNG_TANGAN_M Operator4	0.125000 1
			SARUNG_TANGAN_M Operator5	0.125000
			SARUNG_TANGAN_M Operator6	0.125000
			SARUNG_TANGAN_M Operator7	0.125000
			SARUNG_TANGAN_M Operator8	0.125000
SARUNG_TANGAN_M SETTER_4	wait .1346	1	SARUNG_TANGAN_M Operator1	0.125000 1
			SARUNG_TANGAN_M Operator2	0.125000
			SARUNG_TANGAN_M Operator3	0.125000
			SARUNG_TANGAN_M Operator4	0.125000
			SARUNG_TANGAN_M Operator5	0.125000
			SARUNG_TANGAN_M Operator6	0.125000
			SARUNG_TANGAN_M Operator7	0.125000
			SARUNG_TANGAN_M Operator8	0.125000
SARUNG_TANGAN_M Operator1	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator2	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator3	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator4	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator5	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator6	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator7	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_M Operator8	wait .175	1	SARUNG_TANGAN_M EXIT	FIRST 1
SARUNG_TANGAN_I BUFFER_STOCK				
	ACCUM 86			
		1	SARUNG_TANGAN_I MESIN_DOTTING_I	FIRST 1
SARUNG_TANGAN_I MESIN_DOTTING_I	wait .0475 accum 24	1	SARUNG_TANGAN_I SETTER_1	0.250000 1
			SARUNG_TANGAN_I SETTER_2	0.250000
			SARUNG_TANGAN_I SETTER_3	0.250000
			SARUNG_TANGAN_I SETTER_4	0.250000
SARUNG_TANGAN_I SETTER_1	wait .1346	1	SARUNG_TANGAN_I Operator1	0.125000 1
			SARUNG_TANGAN_I Operator2	0.125000
			SARUNG_TANGAN_I Operator3	0.125000
			SARUNG_TANGAN_I Operator4	0.125000
			SARUNG_TANGAN_I Operator5	0.125000

			SARUNG TANGAN_L Operator6	0.125000
			SARUNG TANGAN_L Operator7	0.125000
			SARUNG TANGAN_L Operator8	0.125000
SARUNG_TANGAN_L SETTER_2	wait .1346	1	SARUNG TANGAN_L Operator	0.125000 1
			SARUNG TANGAN_L Operator2	0.125000
			SARUNG TANGAN_L Operator3	0.125000
			SARUNG TANGAN_L Operator4	0.125000
			SARUNG TANGAN_L Operator5	0.125000
			SARUNG TANGAN_L Operator6	0.125000
			SARUNG TANGAN_L Operator7	0.125000
			SARUNG TANGAN_L Operator8	0.125000
SARUNG_TANGAN_L SETTER_3	wait .1346	1	SARUNG TANGAN_L Operator	0.125000 1
			SARUNG TANGAN_L Operator2	0.125000
			SARUNG TANGAN_L Operator3	0.125000
			SARUNG TANGAN_L Operator4	0.125000
			SARUNG TANGAN_L Operator5	0.125000
			SARUNG TANGAN_L Operator6	0.125000
			SARUNG TANGAN_L Operator7	0.125000
			SARUNG TANGAN_L Operator8	0.125000
SARUNG_TANGAN_L SETTER_4	wait .1346	1	SARUNG TANGAN_L Operator	0.125000 1
			SARUNG TANGAN_L Operator2	0.125000
			SARUNG TANGAN_L Operator3	0.125000
			SARUNG TANGAN_L Operator4	0.125000
			SARUNG TANGAN_L Operator5	0.125000
			SARUNG TANGAN_L Operator6	0.125000
			SARUNG TANGAN_L Operator7	0.125000
			SARUNG TANGAN_L Operator8	0.125000
SARUNG_TANGAN_L Operator	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator2	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator3	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator4	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator5	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator6	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator7	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1
SARUNG_TANGAN_L Operator8	wait .1346	1	SARUNG TANGAN_L EXIT	FIRST 1

* Arrivals *

Entity	Location	Qty each	First Time Occurrences	Frequency	Logic
--------	----------	----------	------------------------	-----------	-------

```

-----
SARUNG_TANGAN_S BUFFER_STOCK      60          inf          1          SEND E(143546.0) SARUNG_TANGAN_S TO

SARUNG_TANGAN_M BUFFER_STOCK      60          inf          1          SEND ER(84530.3, 2.0) SARUNG_TANGAN

SARUNG_TANGAN_L MESIN_DOTTING_L 60          inf          1          SEND W(1.09025, 47891.8) SARUNG_TAN

```

```

*****
*                               Shift Assignments                               *
*****

```

Locations	Resources	Shift Files	Priorities	Disable Logic

MESIN_DOTTING_L		C:\My Documents\DEFINESHIFT.sft	(0 99,99,99,99	No
MESIN_DOTTING_M1				
MESIN_DOTTING_M2				
MESIN_DOTTING_M3				
MESIN_DOTTING_M4				
MESIN_DOTTING_S				
Operator				
Operator2				
Operator3				
Operator4				
Operator5				
Operator6				
Operator7				
Operator8				
SETTER_1				
SETTER_2				
SETTER_3				
SETTER_4				

```

*****
*                               External Files                               *
*****

```

ID	Type	File Name	Prompt
(null)	Shift	C:\My Documents\DEFINESHIFT.sft	

General Report

Output from C:\My Documents\TA\modeltarev-1.MOD

Date: Jan/04/2001 Time: 04:33:09 AM

Scenario : Normal Run

Replication : 1 of 1

Simulation Time : 168 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Minutes Per Entry	Average Contents	Maximum Contents	Current Contents	% Util
MESIN DOTTING M1	168	86	3821	16.095736	6.10137	67	5	7.09
MESIN DOTTING M2	168	86	3932	52.670562	20.5457	72	20	23.89
MESIN DOTTING L	168	86	12618	16.778908	21.0036	86	18	24.42
MESIN DOTTING S	168	86	20551	5.499337	11.212	86	7	13.04
MESIN DOTTING M3	168	86	3953	44.759149	17.5529	71	17	20.41
MESIN DOTTING M4	168	86	3860	53.161004	20.3573	73	20	23.67
SETTER 1	134.2166667	130	12334	4.537605	6.94981	130	0	5.35
SETTER 2	134.2166667	130	12135	4.556991	6.86689	130	0	5.28
SETTER 3	134.2166667	130	12176	4.556428	6.88924	130	0	5.30
SETTER 4	134.2166667	130	12003	4.570447	6.81225	130	0	5.24
Operator	134.2166667	100	6198	4.200000	3.23253	100	0	3.23
Operator2	134.2166667	100	6077	4.200000	3.16943	99	0	3.17
Operator3	134.2166667	100	6000	4.200000	3.12927	100	0	3.13
Operator4	134.2166667	100	6108	6.129071	4.64875	100	0	4.65
Operator5	134.2166667	100	8670	4.200000	4.52179	100	0	4.52
Operator6	134.2166667	100	5999	4.200000	3.12875	100	0	3.13
Operator7	134.2166667	100	6015	4.200000	3.13709	100	0	3.14
Operator8	134.2166667	100	6140	4.200000	3.20228	100	0	3.20
BUFFER STOCK	168	720	49455	146.006693	716.345	720	720	99.49

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location	Scheduled	% Partially	%	%
----------	-----------	-------------	---	---

Name	Hours	Empty	Occupied	Full	Down
MESIN DOTTING M1	168	0.02	99.98	0.00	0.00
MESIN DOTTING M2	168	0.02	99.98	0.00	0.00
MESIN DOTTING L	168	0.03	96.08	3.89	0.00
MESIN DOTTING S	168	0.02	94.69	5.29	0.00
MESIN DOTTING M3	168	0.02	99.98	0.00	0.00
MESIN DOTTING M4	168	0.05	99.95	0.00	0.00
SETTER 1	134.2166667	93.93	0.89	5.18	0.00
SETTER 2	134.2166667	93.93	1.25	4.82	0.00
SETTER 3	134.2166667	93.93	1.35	4.72	0.00
SETTER 4	134.2166667	93.93	1.66	4.41	0.00
Operator	134.2166667	95.44	4.54	0.02	0.00
Operator2	134.2166667	95.44	4.56	0.00	0.00
Operator3	134.2166667	95.44	4.56	0.00	0.00
Operator4	134.2166667	94.65	2.28	3.07	0.00
Operator5	134.2166667	95.29	0.32	4.39	0.00
Operator6	134.2166667	95.44	4.52	0.03	0.00
Operator7	134.2166667	95.44	4.55	0.01	0.00
Operator8	134.2166667	95.44	4.52	0.04	0.00
BUFFER STOCK	168	0.01	3.41	96.58	0.00

FAILED ARRIVALS

Entity	Location	Total
Name	Name	Failed
SARUNG TANGAN S	BUFFER STOCK	583677
SARUNG TANGAN M	BUFFER STOCK	589157
SARUNG TANGAN L	BUFFER STOCK	592111

ENTITY ACTIVITY

Entity	Total	Current	Average	Average	Average	Average	Average
Name	Exits	Quantity	Minutes	Minutes	Minutes	Minutes	Minutes
		In System	In System	In Move	Wait For	In	Blocked
				Logic	Res, etc.	Operation	
SARUNG TANGAN S	17948	579	20.707059	0.000000	0.937241	8.061830	11.707988
SARUNG TANGAN M	15504	139	12.918755	0.000000	2.122485	7.467000	3.329271